

OVER 24 HOMES IN FREDERICK AND WASHINGTON COUNTIES

# Western Maryland

## Tour of Solar and Green Homes

# October 2 - 3, 2010

11am to 5pm



**This  
booklet is  
your ticket**

One ticket per car  
bring family & friends

**NO RAIN DATE**

[www.solartour.org/md](http://www.solartour.org/md)

**\$2.00**

Sponsored by:  
Virginia Solar Council  
Frederick County Office of Environmental Sustainability



## ***Start Saving With Solar.***

Act today and enjoy all the energy saving advantages of solar with attractive tax credits, rebates and grants. Save as much as 60% on the cost of your new solar system. But savings incentives are disappearing fast, so don't delay!

### **Standard Solar: The Trusted Solar Leader**

- The largest solar installer in the Mid-Atlantic with more than 650 solar installations producing over 6 megawatts of electricity
- Featuring the industry's most advanced system monitoring technology for optimal solar system performance
- The most experienced solar experts - 1 out of every 6 NABCEP certified PV installers in MD, DC and VA is employed by Standard Solar

### **Your Solar Partner For Life**

Standard Solar partners with you for the life of your solar electric system. Offering complete system installation, service and monitoring, Standard Solar sets the standard for reducing energy costs with clean, green, renewable solar energy.

### **Get a Free Solar Evaluation**

**Call 1-888-474-3843 or email [info@standardsolar.com](mailto:info@standardsolar.com) today!**



**STANDARD  
SOLAR®**

# 2010 TOUR OF SOLAR HOMES

**W**elcome to the 1st Annual  
Western Maryland Tour of  
Solar and Green Homes.

**Part of the American Solar Energy  
Association's National Tour of  
Solar Homes.**

## *2010 Tour Info*

*Over 24 solar and green homes  
on tour for 2010*

*Homes are open from 11:00 am  
to 5:00 pm, October 2 and 3*

*Plan your trip in advance with  
our handy centerfold maps*

*As you see the homes, consider  
energy improvements to your  
own home*

*Visit the solar tour website for  
updates and changes at  
[www.solartour.org/updates.htm](http://www.solartour.org/updates.htm)*

*This tour is part of the larger 20th  
annual Metro Washington, D.C.  
Tour of Solar Homes. This year  
we have an additional 74 homes  
listed on that tour.*

### ***Who's that up on the roof?***

*That's Zayn Bradley of Sustainable  
Energy Solutions. This house is  
Home 5 on the tour.*



**T**hank you for taking part in what we hope will be an exciting and informative tour of solar and environmentally friendly homes. This guide book is your ticket to see the homes and will provide you with information and directions to the homes that are showcased throughout the Western Maryland Region.

It will also be a handy reference for those considering stepping up into the world of solar energy. This guide includes articles and success stories from leading experts in the industry and ads from local area installers. We have also included a listing of credits and incentives for each locality.

Because the homes are spread throughout a wide area, we suggest that you plan your tour in advance to maximize the number of sites you will be able to see. We have included different homes on each day of the tour and handy maps in the center of the guide.

We hope you will come away with an appreciation of how and why each of these buildings was developed and an understanding of their features. Consider incorporating these energy saving features in your own present or future solar home.

Just as important as the financial benefit is the minimal impact solar and energy efficient homes have on the environment. Finally, conserving energy offers us a way to do our part to address acid rain, global warming and fossil fuel usage so that we may preserve our heritage for future generations.

# Contents



- 5 Forward to the Tour**  
by Representative Roscoe Bartlett
- 6 Solar PV ROI**  
by Fred Ugast
- 7 Solar Thermal ROI**  
by Curtis Nelson
- 8 Case Study**  
by Tim Jones
- 10 FC Sustainability Commission**  
by Don Briggs
- 13 Saturday Homes**  
by "the Homeowners"
- 18 Centerfold Solar Tour Map**
- 20 Sunday Homes**  
by "the Homeowners"
- 30 Conservations Tips**
- 31 What's a SREC**  
by Fred Ugast
- 32 Transforming a historic Middletown house**  
by Charles Jenkins
- 35 Office of Environmental Sustainability Initiatives**  
by Hilari Varnadore
- 36 Resources**

## **1ST ANNUAL WESTERN MARY- LAND TOUR OF SOLAR AND GREEN HOMES**

The Annual Solar Tour of Homes is organized by a staff of dedicated volunteers to educate the public on the positive aspects of Solar Energy.

### **SOLAR TOUR STAFF**

Rich Maranto - Western MD Tour  
[rich@mdgoesgreen.org](mailto:rich@mdgoesgreen.org)

Chip Gribben - Guide/Website Design

Dave Arthur - Guide Design

### **METRO WASHINGTON D.C. TOUR**

Charlie Garlow - Chairman  
[charliegarlow@solartour.org](mailto:charliegarlow@solartour.org)

Jeanie Osborne - Homes Coordinator  
[homes@solartour.org](mailto:homes@solartour.org)

Al Soble - Treasury

Steve Gorman - Public Relations

Sat Jiwan Inkle-Khalsa - Takoma Park Tour

Rich Maranto - Maryland Tour

John Lippert - Greenbelt Homes

Chip Gribben - Guide/Website Design

### **ACKNOWLEDGMENTS**

Virginia Solar Council  
P.O. Box 8689, Alexandria, VA 22306

Frederick County Office of  
Environmental Sustainability  
[www.frederickcountymd.gov/sustainability](http://www.frederickcountymd.gov/sustainability)  
(Funding support through the Department of  
Energy under Award Number DE-SC0002637)

Maryland Goes Green  
[www.mdgoesgreen.org](http://www.mdgoesgreen.org)





# Frederick County Office of Environmental Sustainability

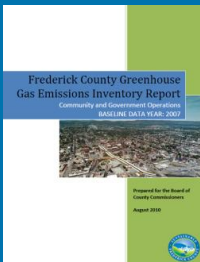
*Ensuring Our County's Future*

*Established by the Frederick County Board of Commissioners in 2008, our mission is to advance practical solutions for protecting the environment, conserving energy and living sustainably in Frederick County, Maryland.*

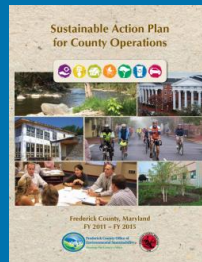


Energy conservation • Climate mitigation • Green building practices • Chesapeake Bay protection • Sustainability performance and planning • Outreach

Recent publications from the Office of Environmental Sustainability



Frederick County  
Greenhouse Gas  
Emissions Inventory  
Report, August  
2010



Sustainable Action  
Plan for County  
Operations for  
Fiscal Years 2011-  
2015

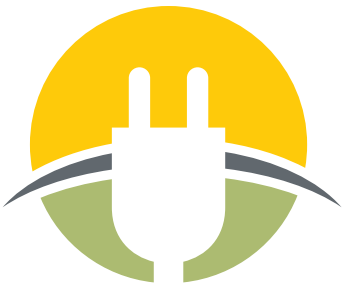
**Frederick County Office of Environmental Sustainability**  
Winchester Hall • 12 E. Church Street • Frederick, MD 21701  
Visit us at [www.SustainableFrederickCounty.org](http://www.SustainableFrederickCounty.org)

# Thinking about "Going Solar"?



USPV represents hundreds of system owners in the SREC markets. We act as your agent to get the best prices available to ensure the highest return on your investment and the fastest payback. Call 301-360-3531 or visit [www.uspvinc.com](http://www.uspvinc.com) to learn how we can help you.

At USPV, we're making solar simple.



**USPV**  
U.S. PHOTOVOLTAICS, INC.

301-360-3531 • [www.uspvinc.com](http://www.uspvinc.com)

# Forward *to the tour*



**Representative Roscoe Bartlett**  
**6th District of Maryland**

***“Technology advances  
have improved  
efficiency and ease  
of use while reducing  
capital and operating  
costs for renewable  
solar power.”***

**A**s an engineer and a scientist as well as a careful shopper, I know there's no comparison to taking the opportunity to see innovative technologies in use and to ask questions about them with their designers and implementers. That is why I encourage you to attend the 1st annual Western Maryland Tour of Solar and Green Homes on October 2-3, 2010. I started studying energy closely more than 35 years ago when I was a Professor. Subsequently, I designed and built my own solar-powered home as well as 50 other solar-powered homes in Frederick County.

There are more and more reasons for homeowners to consider investing in solar power as a supplement or replacement energy source for your home. Conventional fossil fuel energy sources are finite, increasing in costs and produce pollution. Technology advances have improved efficiency and ease of use while reducing capital and operating costs for renewable solar power. Solar thermal water heating has a very short payback period and is cost-competitive compared to natural gas and electricity. As a distributed energy source, solar power eliminates the potential for loss of electricity during blackouts. This benefit is more attractive with fresh memories of the widespread outages from blizzards last winter and thunderstorms during the summer. Federal and state government tax benefits defray the cost to choose solar power. There are also increasing opportunities to sell surplus power generated back into the grid.

Whether you are interested in exploring solar power as an option, want to reduce your home's energy use or carbon footprint or appreciate home design and architecture, I am sure that you will enjoy the Western Maryland Tour of Solar and Green Homes.

# ROI: Solar PV (MD Residential Systems)



**Maryland Energy Agency Solar Grant Program**  
Up to \$10,000 paid directly to the system owner



**Federal Investment Tax Credit**  
30% of the amount paid to purchase and install a PV system completed prior to December 31, 2016 can be deducted as a credit on your income tax.



**Sale of Renewable Energy Credit Certificates (RECs)**  
Special state rules allow owners to participate in programs to sell RECs to utilities and other buyers of clean-energy certificates.



**Electricity Savings on Your Utility Bill**  
Grid connected systems can be net-metered to effectively pay you for the electricity you produce but do not use.



**Increased Resale Value of Property**  
Experts estimate that the value of a property with a PV system is increased by 20 times the yearly electricity savings.



Pro-Formas*:	4 kW	8 kW	10 kW
Installed Cost of System	\$26,000	\$48,000	\$58,000
Maryland State Grant <sup>1</sup>	\$2,000	\$4,000	\$5,000
Federal Tax Credit <sup>1</sup>	\$7,800	\$14,400	\$17,400
Sale of Credits (SRECs) <sup>2</sup>	\$1,280	\$2,880	\$3,520
Electricity Savings in 1st Year <sup>3</sup>	\$590	\$1,180	\$1,475
Total Grants /Credits/Savings Year 1:	\$11,670	\$22,460	\$27,395
Net Cost to System Owner (Year 1):	\$14,330	\$25,540	\$30,605
Years 2-8 Elec. Savings & REC Rev. <sup>3</sup> :	\$13,950	\$27,620	\$33,955
Net Cost to System Owner (Year 8):	\$380	\$(2,080)	\$(3,349)
Increased Property Resale Value <sup>4</sup>	\$11,798	\$23,597	\$29,496

Over the expected 30 year life of the system an owner can expect to save more than \$30,000 (4 kW), \$60,000 (8 kW) or \$76,000 (10 kW) on their electric bill if the cost of electricity increases just 3.5% per year.

**Bottom Line: 8-Year Payback plus thousands in additional electricity savings...**

\*For illustrative purposes only. Actual costs and incentives depend upon site conditions and programs that are applicable to your situation. These pro-formas are not guaranteed and are subject to change without notice. Check [www.dsireusa.org](http://www.dsireusa.org) for the latest information on incentives.<sup>1</sup>


1 Dependent upon state funding. FY 2011 Program effective July 1, 2010. \$.50 per watt, 20 kW Max.  
2. SREC sales assume yearly sales at 80% of Alternative Compliance Payment  
3. Electricity costs assume \$.012 per kWh in Year 1 rising by 3.5% per year thereafter  
4. Property Resale Value assumes 20 x annual electricity savings





# ROI: Solar Thermal (MD Residential Systems)

Solar thermal refers to the heating of a fluid, often water or air, to provide heat or hot water for your home or business.



 **Maryland Energy Agency Solar Grant Program**  
Up to \$1,500 paid directly to the system owner

 **Federal Investment Tax Credit**  
30% of the amount paid to purchase and install a Solar Thermal system completed prior to December 31, 2016 can be deducted as a credit on your income tax.

 **Electricity Savings on Your Utility Bill**  
For a 30-tube SPP system, the savings would be 400kW per month.

The chart below compares the following three systems:

- 1. 30-tube Solar Panels Plus (SPP) system (2", double-walled evacuated tubes) sized to provide domestic hot water for 2 to 4 people (about 36,000 BTU).
- 2. 24-tube Earthnet Energy (ENE) system (4", single-walled evacuated tubes) sized to provide domestic hot water for 4 to 5 people (about 52,000 BTU).
- 3. 60-tube Solar Panels Plus (SPP) system (2", double-walled evacuated tubes) sized to provide domestic hot water for 5 to 7 people (about 72,000 BTU)

Pro-Formas*:	30-Tube (SPP)	24-Tube (ENE)	60-Tube (SPP)
Installed Cost of System	\$8,000	\$10,000	\$13,000
Maryland State Grant <sup>1</sup>	\$1,500	\$1,500	\$1,500
Federal Tax Credit <sup>1</sup>	\$2,400	\$3,000	\$3,900
Electricity Savings in 1st Year <sup>2</sup>	\$480	\$720	\$960
Total Grants /Credits/Savings Year 1:	\$4,380	\$5,220	\$6,360
Net Cost to System Owner (Year 1):	\$3,620	\$4,789	\$6,640
Years 2-8 Electricity Savings <sup>2</sup> :	\$3,360	\$5,040	\$6,720
Net Cost to System Owner (Year 7):	\$260	\$(251)	\$(80)

Over the expected 20-year life of the system an owner can expect to save more than \$14,400 (24 ENE), \$9,600 (30 SPP) or \$19,200 (60 SPP) on their electric bill if the cost of electricity remains at .10 kWh.

**Bottom Line: 8-Year Payback plus thousands in additional electricity savings...**

\*For illustrative purposes only. Actual costs & incentives depend upon site conditions and programs that are applicable to your situation. These pro-formas are not guaranteed and are subject to change without notice. Check [www.dsireusa.org](http://www.dsireusa.org) for the latest information on incentives.<sup>1</sup>

1 Dependent upon state funding. FY 2011 Program effective July 1, 2010.  
2. Electricity costs assume \$0.10 per kWh in all years

# Case study

## Maryland Home Performance with ENERGY STAR® and Glory Energy Solutions LLC

### Customer:

David & Jan Barrow

### Location:

Myersville, Maryland

### Work completed:

March 2010

### Improvements:

- Duct sealing
- Installed foam insulation to air seal and improve under-insulated areas
- Replaced water heater
- Replaced HVAC system
- Replaced wall oven, range, refrigerator, outdoor lighting
- Replaced TV's
- Installed a solar panels

### Benefits:

- 10,500 kWh saved annually from improvements
- 22,000 kWh generated annually from solar array
- 570 gallons of propane saved annually
- 3,500 lbs of wood pellets saved annually
- 82,550 pounds of reduced carbon dioxide emissions annually
- 93.2% annual energy savings
- Faster cooking
- Safer cook top
- No more cold rooms!



### Meet David & Jan Barrow

The Barrows live in a fifteen year old home on seventeen acres in Myersville, Maryland. The Rambler style home was initially

designed with energy efficiency in mind. The house was placed on the property to gain the benefits of passive solar on the southern side of the house while the lower level is below grade on the northern side. The insulation was increased from the minimum requirements for the area to R-24 in the walls and R-40 in the attic. They have placed fourteen acres of their property in the Maryland tree farm program, planting three of those acres in the Chesapeake Bay Watershed.

### Why the Barrows Decided to Make Changes

Concerns about the environment, comfort level, rising energy cost and pending retirement drove the Barrows to look at ways to make their home more efficient without sacrificing their way of life.

### Getting Started

David called Glory Energy Solutions, a local participating contractor with the Maryland Home Performance with ENERGY STAR program, and scheduled an energy audit. Glory Energy performed a comprehensive assessment of the home including tests on the home's building shell to determine the causes of the home's comfort and energy issues.

### Findings

- Glory Energy found numerous opportunities for improvement that included air infiltration problems, missing/misplaced insulation and related energy efficiency improvements.
- Aging equipment needing upgrades



# Case study

## Maryland Home Performance with ENERGY STAR® and Glory Energy Solutions LLC



### Actual cost:

- \$136,500 upfront cost

### Credits, Grants, SRECs:

- \$39,135 Federal tax credit
- \$11,320 Maryland grant
- \$58,804 Sale of SRECs

### Net cost:

- \$27,241 net cost

### Annual savings:

- \$5,400 savings

### The Improvements

- Installed foam installation to stop air infiltration.
- Replaced the hybrid heat pump/propane HVAC system with a geothermal HVAC system.
- Replaced hot water heater with a 96% efficient gas condensing hot water heater in series with a geothermal hot water heater.
- Replaced single wall oven with a unit that provides two ovens in the space of one. The larger of the two ovens is a convection oven. The combined ovens use 20% less energy than the older single oven.
- Replaced refrigerator with a high efficient model.
- Replaced radiant cook top range with an induction cook top range with convection oven. 22% efficiency gain.
- Replaced aging tube TV's with LED TV's. This provided a 95% efficiency gain and permitted the conversion to High Definition displays.
- Installed a 17 kWh solar array to produce the remaining energy they use.

### Results

The benefits of the energy improvements the Barrows have made have increased their home's energy efficiency by 93.2% and made their home more comfortable for all seasons. They reduced their annual CO2 emissions by an estimated 82,550 pounds. The total cost for all the projects the Barrows did was \$136,500 however after tax credits, grants, and solar renewable energy credits, the net cost was \$27,241. The utilities savings of \$5,400 per year has a payoff point for the work completed in 5.5 years. If you were to subtract the cost of equipment that failed and was scheduled to be replaced anyway the net cost is lowered to \$18,391, the net payoff is lowered to 3.5 years.

**The Barrow's home is letter "G" on the Sunday tour.**



## A Message from the Chairman of the Frederick County Sustainability Commission

Dear Participants and Sponsors of the 2010 Western Maryland Solar and Green Homes Tour:

On behalf of the Frederick County Sustainability Commission, welcome to the Tour! We are pleased to share with you green homes and renewable energy projects right here in our great county. We *are* the "Maryland of the future." As the Solar Tour celebrates its 20<sup>th</sup> anniversary, our thirteen member commission is celebrating its 1<sup>st</sup>.

The commission's charge is to advance and accelerate the adoption of measurable strategies that solve environmental problems, protect critical natural resources, and strengthen our social and economic health now and in the future. We actively engage the community and make recommendations to the Board of County Commissioners. To this end the commission produced and presented a work plan to the Board in April with prioritized goals and actions. The work plan was accepted by the Board and now serves as a complement to the county's commitment to climate, energy and environmental goals.

### ***The commission's work plan addresses these program areas and goals:***

**Sustainability Leadership and Education:** Frederick County will be actively engaged in the sustainability movement, from the local level to national networks of cities and counties. We will build community understanding of sustainability and the triple bottom line.

**Agriculture and Food:** Frederick County will satisfy its human food and fiber needs with locally produced goods and sustain the economic viability of farm operations.

**Waste and Recycling:** We will reach a 60% waste diversion rate by 2024.

**Green Neighborhoods:** We will promote environmentally responsible neighborhood design in new and existing communities and make Frederick County more bicycle and pedestrian friendly.

**Green Buildings and Energy:** We will reduce energy consumption and greenhouse gas emissions by decreasing our community's reliance on fossil fuels. We will enhance the energy performance and resource efficiency of our communities and its associated building stock.

**Watershed Conservation and Restoration:** Frederick County will protect and restore the biological integrity of our natural environment and protect surface and ground water sources. We will educate the public on the value of green infrastructure.

The work plan is only the beginning for the commission, now comes the implementation of which this tour is a part.

Again, welcome and enjoy the tour!

A handwritten signature in blue ink, appearing to read "Donald N. Briggs".

Donald N. Briggs, Chairman



HELPING  
**HOMEOWNERS**  
POWER MARYLAND'S  
**CLEAN  
ENERGY  
FUTURE**

For information on energy audits and financing incentives, visit our website.



**MARYLAND**  
CLEAN ENERGY CENTER

[www.mdcleanenergy.org](http://www.mdcleanenergy.org)



***Total  
Comfort***  
Inc.

**Heating and Air Conditioning**

**Over 430 Successful  
Geothermal Installations**

- **Save up to 70% on your utility bills**
- **Take advantage of the 30% Federal Tax Credit**
- **WaterFurnace Factory Trained Technicians**
- **14 years experience specializing in Geothermal Installation & Repair**

**301-824-3700**

**[www.tcgeothermal.com](http://www.tcgeothermal.com)**

Smithsburg, MD HVACR 01-5833

**SUSTAINABLE ENERGY SYSTEMS, LLC**

Solar Water Heating - Solar Pool Heating  
Photovoltaics - Radiant Floor Heating  
Design - Installation - Service  
(301)788-4003

[www.SustainableEnergySystems.net](http://www.SustainableEnergySystems.net)



Let Us Help You Take Advantage of Free, Abundant  
Energy. Save Money, Use Clean Solar Energy!

Call us Today for a Solar Site Evaluation. 301-788-4003



Trained and Experienced Installers.  
Licensed and Insured.

OUR MISSION is to create a sustainable energy future by installing the most efficient, cost effective systems with the smallest ecological footprint possible.



Save **Energy**  
Make **Energy**

Professional Energy Audits • Energy Consultants  
Home Energy Improvements • Solar Electric Systems  
**Home & Commerical**

**[www.GloryEnergySolutions.com](http://www.GloryEnergySolutions.com)**  
**(301) 432-5874**



*This log home in  
Woodsboro features a  
solar hot water system.*



*Mountainside Enrichment and Education campus  
features a 10kW solar array and a 10kW wind turbine.*

## FEATURED SOLAR/GREEN TECHNOLOGIES



Photovoltaic panels (PV)



PV panels with battery  
backup system



Solar hot water  
system



Passive solar home



Solar space heating



Solar attic fan



Greenhouse



Green roof



Geothermal



Wind power



Strawbale construction



Superinsulation



High efficient  
windows



Recycled building  
materials



Corn/wood stove



Energy efficient  
appliances



High efficient lighting



Low water consumption



Tankless water heater



Rainwater collection  
system



Rain garden



Composting



Alternative energy  
vehicle



## 17645 Harbaugh Valley Rd, Sabillasville, MD



### DIRECTIONS

Follow Rt. 15 North toward Gettysburg, PA. Take exit for Rt. 550 North toward Sabillasville. At end of exit ramp, turn LEFT on to Rt. 550. Follow Rt. 550 for six miles. You will enter the very small town of Sabillasville, turn RIGHT onto Harbaugh Valley Road. St. John's United Church of Christ and a small cemetery will be on the right at the corner. Proceed 1 mile. Turn RIGHT again to stay on Harbaugh Valley Road. Proceed .7 miles. The Hope Alive house is on the right at the #17645 address sign.



### ABOUT THE HOME

Hope Alive, Inc. is a non-profit, non-denominational Christian ministry serving homeless women and their children. In addition to the solar panel installation, Hope Alive has been recycling all paper, plastic and metal waste materials, tracking energy usage, install pipe insulation, insulate the attic, close & insulate two fireplaces & the elevator shaft, seal all HVAC vents and duct work, and closed interior penetrations and wall tops. A generous Hope Alive donor provided enough fluorescent light bulbs to replace all incandescent bulbs in the home.



## 9339 Appolds Rd, Rocky Ridge, MD



### DIRECTIONS

We are located off Appolds Road at 9339, which is about 1/4 mile east of the Intersection of Old Frederick Road. From the square in Thurmont you will follow 77 East to Old Frederick Road, Right on Old Frederick for about 1/4 mile and then Right again on Appolds for another 1/4 mile and we are on the right.

### ABOUT THE HOME

We manufacture solar powered electric vehicle charging stations. We will have an electric car here being charged by solar power. In addition we have a 2200 Sq. Ft. home attached to a 6.8 KW solar array.







## 14020 Motters Station Rd, Rocky Ridge, MD



### DIRECTIONS

From Frederick, MD Route US 15 north towards Gettysburg, 19.6 miles Turn Right on Route 76 / Motters station Road 4.5 miles, gated farm lane on right.

### ABOUT THE HOME

The Farm combines wind power (2.4 kW Wind Grid Tie Turbine. Commissioned June 07) with solar panels (5.52 kW Solar Grid Tie System. Commissioned Feb. 09) and other efficient conservation measures resulting in 100% energy saving by April 2009 only 2-months after the solar panel system first came on line, plus banking 240 kilowatt hours of credited power by turning the electric meter backwards. The owner sees this trend continuing banking Kilowatt-hours to be used during the winter months when most of this farm's energy is consumed. These resulting achievements have inspired the owner to try to be 100% energy efficient year round by researching and possibly investing in Geothermal heating and Solar hot water heating which makes up the bulk of this farms the energy bill on its newly constructed Indoor riding facility. Composting and Soil Management Farms can be part of an overall effort to better manage and reduce non-point sources of pollution (nitrogen, phosphorus, and pathogens) to drainage basins of the Chesapeake bay. Composting produces a stable, volume reduced, and storable product with greatly reduced pathogen levels while conserving some of the nutrients. The compost can be used on or off farm when and where the nutrients are needed.



## 1723 Clear View Rd, Union Bridge, MD



### DIRECTIONS

From Frederick, MD: From Frederick, MD: Take Rt 15 north; turn Right onto RT26 East. Turn Left onto 194 N. Go to Carroll County. Approx. 2 miles past Ladiesburg, turn Right onto Y Rd. At end of Y Rd., turn Right on Middleburg Rd. Turn Left on to Clear View Rd. Go 3 miles; 1723 is on the right (after the farm). Turn on the dirt/grass road to go the barn.

### ABOUT THE HOME

We have a 7.2kW (32 panels) dual tracker 2-pole mount PV system which is grid-tied. The house has a programmable 6 zone-18 SEER HVAC system with oil backup. All appliances are Energy Star rated including a front-loading washer and dryer. Windows are high efficient low E. We also own a Prius Hybrid.





## 10126 Woodsboro Rd, Woodsboro, MD



### DIRECTIONS

From Frederick, MD: Rt. 15N, Turn right onto Rt. 26 East, turn left on Rt. 194 Take Rt. 194 out of Frederick. Go through Walkersville to Woodsboro. Take a RIGHT on Rt. 550 (Woodsboro Rd). Go about 2.5 miles and turn RIGHT onto PARSONS VALE (white road sign, mailboxes on left at bottom of hill, dirt road). Follow dirt road. Turn RIGHT at fork. Follow to end of road. Log Home with wrap-around porch and green shingles.



### ABOUT THE HOME

This is a standard log home with a solar water heating system, a super-insulated roof, and a multi-fuel furnace (oil, wood). The solar water heating system has a solar powered pump. The house sits on top of a hill on a wooded lot. We have a small chicken house, solar clothes dryer and a rotating barrel composter.



## 3937 Loch Ness Ct, Frederick, MD (Urbana)



### DIRECTIONS

From Frederick, take I-270 S toward Washington. Take the MD-80 exit, EXIT 26, toward Urbana. Enter next roundabout and take 1st exit onto MD-80 East Fingerboard Rd. Pass through 1 roundabout. Turn LEFT onto Royal Crest Circle. Turn LEFT to stay on Royal Crest Circle. Turn RIGHT onto Lochness Court.



### ABOUT THE HOME

Our decision to install solar panels for electric, solar panels for hot water, and replace our existing HVAC system for geothermal is all based around attempting to save money and the environment! All 3 of these systems together should get our home off of the grid. We also understand what good all of our changes will do for the planet as a whole. Getting this project approved by our HOA was long, but not very difficult now that we look back on it. It took so long because the project was the first of its kind in the neighborhood.



## 2914 Roderick Rd, Urbana, MD



### DIRECTIONS

From Frederick, take 270 south to Exit 26 (MD-80, Urbana/Buckeystown). At the traffic circle, take the 2nd exit onto MD-80 W/Fingerboard Rd. Go about mile and turn left onto Roderick Road. Mountainside is 2 miles on your right.

### ABOUT THE HOME

Mountainside is an active summer camp as well as a campus for Mountainside Enrichment and Education, a non-profit created to teach renewable resources. Mountainside is home to a 10-kilowatt solar array as well as a 10-kilowatt wind turbine. Both systems are monitored for efficiency and power output from a computer station located in our front office. In efforts to teach both adults and children alike Mountainside has a number of other environmentally friendly installations and projects that include rain gardens, composting toilets, organic gardens, 4000 riparian tree buffer, and a wetlands conservation area. Mountainside is also a 115-acre working farm with fields of corn and fruit trees. So come on out we can't wait to see you!



## 6663 Dickerson Rd, Dickerson, MD



### DIRECTIONS

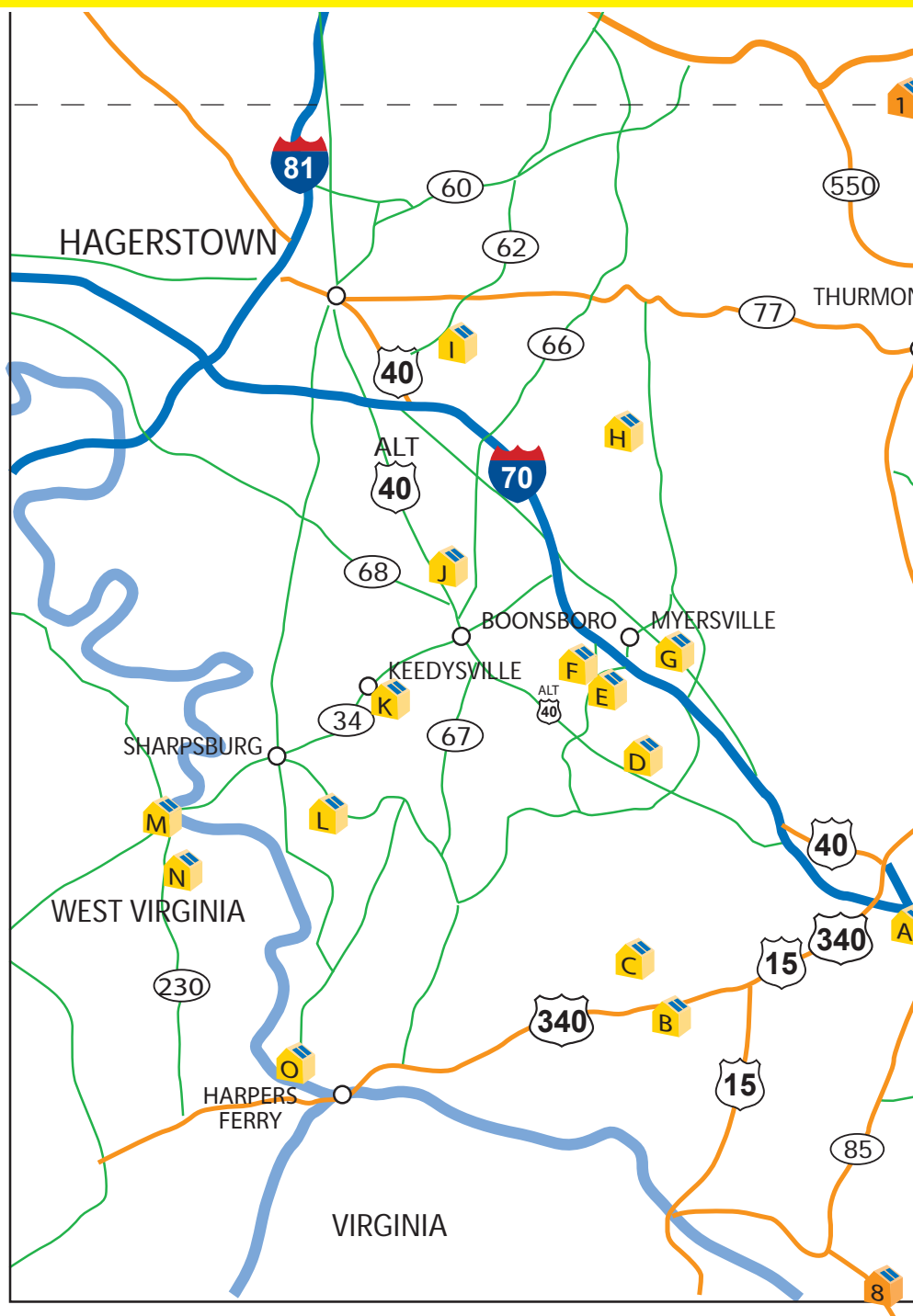
From Frederick, take Rt.270 to MD-85 S/Buckeystown Pike. Go 10.2 miles and continue straight onto MD-28 E/Dickerson Rd. Go 2.2 mi and destination will be on the right.

### ABOUT THE HOME

Potomac Wind Energy Headquarters was established in 2006. It has been responsible for the first modern residential and farm turbines installed in Frederick, Carroll, Howard, Charles, Washington and Montgomery Counties in Maryland as well as at the National Botanical Gardens in Washington, DC. At present there are 10 turbines at our farm ranging from 200W to 20 kW. With the larger turbines, the return on investment can be as short as 7-years based on current MEA grants up to \$20,000, the 30% Federal Tax Credit and current utility rates, for every cent increase in utility rates the payback time is reduced by approximately 9 months.



# Solar home locations









*This home in Sharpsburg is not connected to the power grid.*



*This Myersville home has 94 solar panels and a geothermal heating/cooling system.*

## FEATURED SOLAR/GREEN TECHNOLOGIES



Photovoltaic panels (PV)



PV panels with battery backup system



Solar hot water system



Passive solar home



Solar space heating



Solar attic fan



Greenhouse



Green roof



Geothermal



Wind power



Strawbale construction



Superinsulation



High efficient windows



Recycled building materials



Corn/wood stove



Energy efficient appliances



High efficient lighting



Low water consumption



Tankless water heater



Rainwater collection system



Rain garden



Composting



Alternative energy vehicle



## 5307 Allington Manor Court, Frederick, MD



### DIRECTIONS

*In Frederick, from S. Market St (MD-355), turn Right onto New Design Rd. Turn Right onto Corporate Dr. Turn Right onto St. James Place. Turn Right onto Allington Manor Circle E. Turn Right onto Allington Manor Court. Home is on the Left.*

### ABOUT THE HOME

This is a single family home, with approximately 3000 sq ft of finished space, constructed by Ryland Homes in 1994. The present residents are the original owners. Solar Energy World installed twenty-eight solar panels in early June of this year. The system should not only provide for all the electric needs of the owners, but provide extra energy credits too. In addition to the solar panels, the house has been resided with extra insulation installed under the siding to increase the existing R-value of the side walls. A new, energy efficient natural gas furnace/air conditioner was installed a little over one year ago, and all kitchen appliances were replaced with energy efficient units at the same time. The existing deck was converted into a sunroom with energy efficient thermal windows on all sides and the ceiling. The original windows of the residence were replaced with energy efficient thermal windows and the front entrance door was replaced with a thermal efficient entry system.



## 4121 Spring View Drive, Jefferson, MD

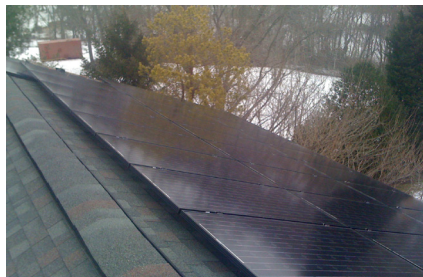


### DIRECTIONS

*Directions, 340 West to Jefferson, Lander Rd exit, Left off ramp, 1st right Roundtree Rd, Left at end of Roundtree onto Horne Rd. 2nd Left Springview Ct, 1st right Springview Drive, to 4121.*

### ABOUT THE HOME

Our system is 5.7 kW on the roof of a traditional brick home, built in 1986. There is battery back up system with critical loads supported. The solar array is not visible from the street and the house retains its traditional colonial appearance from the curb.





## 4939 Broad Run Rd, Jefferson, MD



### DIRECTIONS

Take US 340 to the Lander Rd/Jefferson exit. Go right at exit to a left at the stop light. Go through town. Turn right on Rt. 383 (Broad Run Rd) across from Valley Elementary school. Our farm is 1 ½ miles on the right. White house with large red barn.

### ABOUT THE HOME

We have a 25-acre sheep farm. We have won a soil conservation award as well as meeting the qualifications for the Maryland Nutrient Management Plan to prevent runoff into the Chesapeake Bay. Our farm operation is set up to be a low consumer of energy. Our house has portions that are over 180 years old. We've weatherized, installed new energy efficient windows and are very conscience of our energy consumption. Our solar system was installed in January 2010. It is a 4.7 kW, 27-panel array. It has reduced our electric bills considerably, although we will need at least another year to determine the overall effect. Check our web site for more information at [catocinccreekfarm.com](http://catocinccreekfarm.com)



## 3120 Old National Pike (alt 40 A), Middletown, MD



### DIRECTIONS

From Frederick: Take Alt. 40-A through Middletown. About 1 mile West of Middletown the home will be on your Right.

### ABOUT THE HOME

Pre-Civil War homes are not generally considered energy efficient, and this was certainly the case for the home we converted into our office on Old National Pike in Middletown, Maryland. In 2007, we decided to embark on a transformation to make our old home into a model of energy efficiency for the future. For details, check out the article "Transforming a historic Middletown house" on page 32 of this publication.



**We will be demonstrating an energy audit, including a blower door test for those interested in learning more about this valuable tool.**

Also, local company TimberRock will have their solar EV charging station on display at this location.





## 9117 Frostown Rd, Middletown, MD



### DIRECTIONS

*From Frederick: Take Alt. 40 through Middletown, west to Mt. Tabor Rd. Turn right on Mt. Tabor. Go 3/4 mile past Station Rd. Stay left and you will be on Frostown Rd. The farm is straight ahead. You'll see a bright red farmhouse and large red barn. Follow Frostown around the curve to our entrance near the barn.*



### ABOUT THE HOME

The Lucy School is housed in a renovated 19th century barn located on a 17-acre farm outside of Middletown, MD. The new school building is registered with the U.S. Green Building Council for certification under the LEED (Leadership in Energy and Environmental Design) program. A building can only receive LEED certification if it meets the highest green building and performance measures. The Lucy School incorporates sensor controlled sinks, dual flush toilets and waterless urinals. Rainwater is filtered throughout the water table through eight rain gardens, as well as being collected in a cistern and used to flush the building's toilets. Gray water is collected from the sinks, water fountains and the washer and is used to water plants. Lucy School relies on an array of sixty grid-tied solar panels manufactured by a local company (BP Solar), which generate sufficient power to reduce the building's electricity use by 15-20%. Four (Water Furnace brand) geothermal heating/cooling systems lessen the school's reliance on the electrical grid even more.



## 9160 Frostown Rd, Middletown, MD



### DIRECTIONS

*Take I-70 W toward Hagerstown/Hancock. Go 6.9 mi, take exit #42 (Myersville/Middletown Rd) toward Middletown. Go 0.3 mi, turn Left on Myersville Rd (MD-17 S). Go 0.3 mi, turn Right on Milt Summers Rd. Go 0.9 mi, turn Left on MT Tabor Rd. Go 0.8 mi, turn Right on Frostown Rd. Go 0.3 mi to home on the left.*

### ABOUT THE HOME

We have one of the first ground-mounted solar array in Frederick County, with 22 (2 rows of 11) panels made by the German company, Schuco. It's a 3.96 kW system, purchased through Greenspring Energy, LLC out of Towson. Our home is a small mid-1800's farmhouse with stone walls on the 1st story and log 2nd story. It has needed a good deal of renovation and we've tried to be environmentally aware and as eco-friendly as possible during the process.







## 10040 Baltimore National Pike, Myersville, MD



### DIRECTIONS

Take I-70 west from Frederick MD to exit 42. Exit onto MD route 17 in the direction of the town of Myersville. Drive through town to stop light at US Route 40 (Note - route 17 takes a right turn in the middle of town). Take a right on route 40 to first driveway on right (follow the tree farm signs to the property).

### ABOUT THE HOME

The house was designed and built in 1995 with the focus on energy efficiency. The insulation was increased in the walls to R24 and the attic to R40 batt insulation. The house's orientation was set to make use of passive solar with roof overhangs increased to prevent summer sun from entering the house. Recently discovered air infiltration issues were resolved with environmentally friendly closed cell spray foam. The HVAC system has been replaced with a Water Furnace Envision geothermal system with an energy efficient fresh air exchanger. The geothermal hot water heater has been installed in series with an AO Smith Vertex 96% efficient gas condensing hot water heater reducing the gas usage by 70%. Supplemental heat in the sunroom is supplied by a pellet stove. Electricity is supplied by a 16.9 kW grid tied solar array made up of 94 - 180 watt Suntech solar panels with Enphase micro inverters. The home owners have replaced washer, dryer, wall oven, and dishwasher with high efficient equipment and will soon be replacing the range with an induction range. Fourteen of this property's seventeen acres have been reforested under the Maryland tree farm program. The forest management plan was designed to create wild life habitats and a riparian forest for the Chesapeake Bay watershed.



## 12529 Loy Wolfe Rd, Myersville, MD



### DIRECTIONS

From Frederick, take Route 40 West towards Hagerstown. Make Right onto Pleasant Walk Rd. Go 2 miles, make Left onto Loy Wolfe Rd. Go 1.6 miles to 12529 Loy Wolfe Rd. Home is on the right.

### ABOUT THE HOME

The 3,300 square foot home is wind powered by Clean Currents their source for electricity. The home has 4 Apricus Evacuated Solar Thermal panels that heat the domestic hot water. It produces 140,000 BTU a day first heating domestic hot water then heating for winter. Also on the home is a 12 kW of solar PV panels producing roughly 75% of their yearly electric needs.



# WHEN LIFE GIVES YOU SUNSHINE, MAKE ELECTRICITY!



## Now is the right time to go solar.

We're ready to design and install a solar panel system for your home that will give you the most for your investment: the most energy generated, the most beneficial environmental impact, and the most joy and pride each time you see a sunny day.



### USE OUR SOLAR CALCULATOR

to get real pricing and see the benefits of powering your home with Astrum Solar®

**LEARN MORE AT [WWW.ASTRUMSOLAR.COM](http://WWW.ASTRUMSOLAR.COM)**



**ASTRUMSOLAR®**

**SEE A SUNNY DAY IN A WHOLE NEW WAY®**





# SUSTAINABLE DESIGN GROUP

PIONEERS IN HIGH PERFORMANCE HOMES SINCE 1973



{We know a few other things too...}  
**STYLE. INNOVATION. EXPERIENCE.**

*At the Sustainable Design Group, we strive to build homes that are good for the planet and good for people. As leaders in sustainable building and community development worldwide for over 35 years, we specialize in zero-energy, off-grid, self-sufficient homes, as well as light commercial buildings. We are master builders committed to craftsmanship and strict environmental protection. Our mission is to build the most comfortable, healthy, efficient, and environmentally responsible homes possible.*



**John W. Spears, LEED AP, CEM, President**  
**Sustainable Design Group, Inc.**  
**(301) 428-1040**



**(301) 428-1040**   **[www.SustainableDesign.com](http://www.SustainableDesign.com)**



## 10912 Sasha Blvd, Hagerstown, MD



### DIRECTIONS

*From Frederick take Route 70 West approximately 15 miles to Exit 34 (Md-66 North, Mapleville Road toward Smithsburg). Proceed 1.6 miles to the traffic circle, go all of the way around, and exit onto Mt. Aetna Road. (Take your time here and enjoy the drive, but be cautious at the sharp curves and hills.). Proceed 2.2 miles and turn right onto Sasha Blvd. The house is the third one on the left, and the only one with a silo.*



### ABOUT THE HOME

The main house is a stone barn built in approximately 1799, and extensively remodeled in 1996. Because of some innovative wall construction and high-efficiency rigid foam roof insulation made the building energy efficient before the solar energy system additions. In 2008 a workshop and garage addition was constructed on the foundation of the original hog pen to provide a south facing roof surface. The solar hot water system is a basic 2-panel flat plate system that provides approximately 75% of our hot water needs, and has been on line since November. The PV system is a 5.1 kW system, and has only been fully operational for two weeks. We are still calculating the net savings from the system.



## 7628 Old National Pike, Boonsboro, MD



### DIRECTIONS

*From Frederick: Take Alternate 40 through Middletown. Stay on Alternate 40 for 11 miles till you come to the light in Boonsboro. Continue straight for another 4 miles thru Boonsboro on Alternate 40 heading towards Hagerstown. The Pharmacy will be on left-hand side of the road about a mile past the American Legion and Terry's Auto Center.*

### ABOUT THE HOME

Due to rising cost of commercial energy, the Boonsboro Pharmacy decided to upgrade the existing light system to new energy efficient tubes. They also installed 10 - 21" Solatubes to bring more natural daylight in the store. The power was out at the store due to a thunderstorm, but because of the Solatubes they thought the store still had electricity. Programmable thermostats were installed to reduce the their energy demand for when the store was closed to prevent unnecessary heating/cooling. In the spring of 2009, the pharmacy decided to reduce their energy demand even more by adding an additional 48 solar PV panels on a Pole Mount system. In spring 2010, we installed 2 new High-efficient HVAC systems and replaced the old ductwork.







## 5709 Red Hill Rd, Keedysville, MD



### DIRECTIONS

*From Frederick: Take Alternate 40 through Middletown. Continue through Middletown. Just before Boonsboro as you come down South Mountain, turn left onto Route 67. Follow route 67 to Mt. Carmel Church Road. Turn right onto Mt. Carmel. Turn right onto Dogstreet. Follow Dogstreet to 4 way stop. At stop, turn left onto Red Hill Road.*

### ABOUT THE HOME

We decided to first upgrade the insulation and replace the electric attic fan with solar powered attic fans in the house before installing the grid-tied P.V. system. This gave the house the proper amount of insulation and allowed the attic heat to be removed for free after replacing the old attic fan. It has helped to reduce our monthly kWh demand. Then we installed Solatubes in the kitchen and hallway to bring more natural daylight into these areas. In 2009, we added a grid-tied pole mount system in the back yard. The system should produce most of our energy needs during the year.



## 4117 Mills Rd, Sharpsburg, MD



### DIRECTIONS

*From Frederick take Alt. 40 through Middletown. Go about 7 miles to Boonsboro. At light, take a left on Rt. 34. Go about 7 miles to Sharpsburg. In Sharpsburg, turn left at Church Street (at the BP station, which turns into Burnside Bridge Road. Stay on Burnside Bridge Road for about 2.5 miles. Turn right onto Mills Road. Stay on Mills Rd. for about 1 mile. After crossing the bridge, turn left into driveway at 4117 Mills Road. Follow the gravel driveway up the hill 1/4 mile to our home.*



### ABOUT THE HOME

Sycamore Farm was built in 1995 and is not connected to the power grid. We have a barnshaped home with PV and wind power, many south facing windows, a thermal chimney, efficient appliances, and a completely insulated 6" concrete foundation that is inside the thermal envelope of the house. We use an on demand propane hot water heater that never runs out of hot water, an oversized pressure tank with a 120V well pump, and a large wood stove with a native stone backing wall. We also have luxuries such as a clothes washer and dryer and a dishwasher.





## 6860 Engle Molers Rd, Shepherdstown, WV



### DIRECTIONS

From Frederick take US 340 W approximately 21 mi, crossing into WV, past Harpers Ferry. Turn Right onto WV 230/Shepherdstown Pike at the stop light (Note, the road makes an immediate sharp turn to the left). Continue for approx. 8 miles. Turn Right onto Engle Molers Road. Go approximately 1/4 mile, turn Left into the first driveway. Continue along the driveway to the back of the property past both the cottage with 2 car garage and the 3 bay barn to the house.



### ABOUT THE HOME

This beautiful craftsman-style home is located on 32 acres of managed timberland. The house is positioned to take advantage of passive solar principles, constructed of Structural Insulated Panels and sheathed in Certainteed concrete board. It has a 1.75 kW PV solar array, solar hot water tubes, radiant floor heat, site harvested hardwood floors and a masonry heater. FSC certified cabinetry and quartz/remnant countertop material is installed in the kitchen and bathrooms. No-VOC paint was used throughout the house. A rainwater collection system stores 1500 gallons of rainwater that feed outdoor hydrants for landscape watering. Additional features: Energy Star appliances, on-demand hot water heater, CFL bulbs in lighting fixtures, High Efficiency HVAC system, thermal windows & doors. This home is also co-located with the only green vacation rental in the Eastern Panhandle.



## 34 little Run Dr. Shepherdstown, WV



### DIRECTIONS

From Frederick take US 340 W approximately 21 miles, passing through Virginia, crossing into West Virginia and past Harpers Ferry. Turn Right onto WV 230/Shepherdstown Pike at the stoplight (After turning at the stop light the road makes an immediate sharp turn to the left). Continue for approx. 8.7 miles to Shepherdstown. Bear Left on E Washington St (CR-480/1). Turn Left on S Church St (CR-480/1). Turn Right on Little Run Drive.



### ABOUT THE HOME

We have a Solar Works solar hot water system. This is an evacuated tube solar collector placed on the roof, it includes a thermal storage tank, earth net meter and gauges. The system supplies our family of three with solar domestic hot water.



## DIRECTIONS

From Frederick take US 340 W to Harpers Ferry. Turn Right on Union St. Turn Right on Washington St (US-340-ALT). Turn Left on McDowell St. Turn Right on E Ridge St. Home is on the left.

## ABOUT THE HOME

I have a 12 panel 175 kW Andalay solar array mounted facing south on my residence in Harpers Ferry WV. It was installed By Environmental Energy Systems based in Harpers Ferry, WV. Each Andalay solar Panel has a microinverter installed on the back side. The enphase microinverters are the latest in inverter technology. By utilizing the microinverters, the panel efficiency is increased by 3-5%. The microinverters also eliminate the need for a combiner box and single inverter. The Andalay system installed by Environmental Energy Systems also has a software monitoring program though which I can monitor the activity and electrical generation remotely from any computer.



# Conservation Tips

1. Seal around fireplace trim, window trim and base-boards
2. Seal between sheathing and foundation on the outside
3. Weather-strip windows, doors, and joints
4. Insulate band joists area
5. Install switch plate and outlet plate insulators
6. Seal basement crawlspace, ceilings and walls
7. Install doorsweeps and new thresholds
8. Caulk and insulate all primary and secondary duct joints, except return duct joints
9. Weather-strip/insulate scuttle hole or attic access doors
10. Weather-strip vertical joints of exterior sliding doors and window air conditioners
11. Weather-strip top, bottom, and sides of garage doors
12. Install radiator reflectors
13. Install air filter alarm; clean and replace regularly
14. Insulate all accessible water heating and hot water pipes
15. Insulate the first 6 feet of cold water pipes leading into water heater
16. Insulate air-conditioner pipes and tubing
17. Install heating/cooling monitors
18. Install setback thermostat
19. Install water miser for toilet tanks, shower and faucets
20. Install hot water tank jacket and insulate with reflective foil
21. Seal around soil vent stacks in attic floor, and around all plumbing access doors
22. Seal mail chutes
23. Install temperature-controlled attic exhaust fans
24. Install dryer vent diverters (electric dryer only)
25. Set thermostat to 68°F in Winter, 78°F in Summer
26. Install automatic foundation vents
27. Install Plug-Itt in fireplaces
28. Install Cap-Itt over pull-down stairs
29. Install pulley plugs over pulleys of double hung windows
30. Reduce hot water temperature to 120°F and periodically drain tank sediment
31. Reduce boiler temperature
32. Reduce low-limit cutoff in the furnace
33. Replace incandescent bulbs with compact fluorescent, cold compact fluorescent or led bulbs
34. Add humidifiers for greater winter comfort at low temps
35. Clean air-conditioner exterior condenser unit
36. Open shades on south-facing windows on sunny days in the winter
37. Minimize use of exhaust fans when A/C or heat is in use
38. Use motion detectors with halogen lamps for outdoor lighting
39. Purchase high-efficiency appliances
40. Use "cool dry" cycle or allow dishes to air dry when using a dishwasher
41. Hang laundry outside to dry on nice days
42. Install ceiling fans to circulate air

# What's a SREC?

---

A Solar Renewable Energy Credit (SREC) is a tradable commodity representing the non-polluting value of 1,000-kilowatt hours (kWh) of electricity produced by a solar electric system. The SREC is separate from the value of the electricity itself and permits the owner or purchaser to claim the benefits of the clean energy production by effectively subsidizing the cost of the installed system.

Twenty-nine states and the District of Columbia have enacted Renewable Portfolio Standards (RPS) legislation that requires electric utilities, electricity suppliers and/or electric distribution companies to produce a certain amount of the electricity they sell from renewable sources.

A number of these jurisdictions, including Maryland, have a "solar carve-out" within the RPS requiring a specific percentage for solar production within the state. Any company in Maryland that sells electricity must either produce the required amount of solar electricity from its own assets, purchase SRECs from PV system owners or pay an Alternative Compliance Payment (ACP) into a fund that will be used to support the construction of solar systems in the state.

Maryland's solar requirement took effect in 2008 requiring approximately 2,500-megawatt hours of solar electric production or 2,500 SRECs. The amount of solar electricity required to be produced increases each year until 2022 at which time solar electricity should account for a full 2% of all the

electricity consumed in Maryland. Suppliers not meeting their obligations are required to pay an Alternative Compliance Payment which effectively sets the maximum value of an SREC on the open market. Maryland's ACP is \$400 per MWh through 2014. A 5 kW solar PV system will produce approximately 6 SRECs per year. Current market prices are approximately \$375 per SREC and are likely to remain in the upper \$300s for the next several years barring an oversupply of SRECs relative to the utility requirements.

To earn and sell SRECs a system owner needs to apply and be certified as a Renewable Energy Facility by the state Public Service Commission. Once certified, a system owner has several options for selling their SRECs, including agents, brokers, auctions and exchanges.

SRECs are an important part of the financial analysis of a solar investment. It's a good idea to ask installers and brokers about the current market value of SRECs and how they can help you to maximize your return on investment.



# Transforming a historic Middletown house...

**P**re-Civil War homes are not generally considered energy efficient, and this was certainly the case for the home we converted into our office on Old National Pike in Middletown, Maryland. In 2007, we decided to embark on a transformation to make our old home into a model of energy efficiency for the future.



Our first goal was to install an ultra-efficient geothermal heating and cooling system. But we quickly realized that such one-dimensional thinking was shortsighted—such a state-of-the-art system was pointless without addressing the envelope of the house itself, which leaked like a sieve!



To identify where improvements should be made, we hired Glory Energy Solutions LLC, an energy auditing and consulting firm. Our challenge was to be responsible by preserving

the historic elements of the home, including: not changing the windows or exterior doors dating back to the early 1800's and leaving the original plaster walls intact and the exterior brick exposed.



A professional home energy audit is the first step to assess how much energy your home consumes and to evaluate the measures you can take to make the home more energy efficient. An energy audit shows where you could be losing significant amounts of money over time by pinpointing where the house loses energy.

Audits also determine the efficiency of your home's heating and cooling systems. Using technologies like infrared cameras and conducting blower door tests, we were able to see exactly where we were losing our heating and cooling. The result of our energy audit provided us a baseline of data and comprehensive list of recommendations for energy performance improvement.

Energy audit in hand, we set about taking corrective measures. We hired Monument Foam Insulators, a Myersville-based company that uses

closed cell polyurethane spray foam insulation. Installation of this type of insulation helps reduce energy costs by as much as 60% and works as a barrier to prevent moisture and air



filtration. We also sealed the fireplace flues and installed vapor barriers in the basement crawl spaces.

Then we continued with additional improvements such as: new weather-stripping at all exterior doors; air-sealed



duct chases; an insulated steel access door to the basement; closed cell foam added to the first floor band boards; sealing off any chases between floors; re-caulking windows; a dual-flush toilet; compact fluorescent light bulbs; timers on all bath fans; foam insulated attic rafters and gables (which gave us file and equipment storage space!); insulation above the 2nd floor porch ceiling with layers of foam; outside LED security lighting to the outside of home and adding blanket insulation

around the hot water heaters.



We also put automatic closers and weather-stripping on attic doors and increased the fiberglass insulation in our workshop by six inches.

### **The Result: A Resounding Success!**

After we took the corrective measures outlined in the energy audit, our building airflow was reduced by nearly 60%, comfort has greatly improved and we reduced our overall utility usage by more than 65% from our initial starting point. The project was a resounding success, and we continue to be committed to reduced consumption of natural resources in our business activities. Our next project is to install solar panels to provide the energy to power our operations.

**Stop by on Sunday October 3 to see what we've accomplished. We will be performing an energy audit all day and answering questions.**

3120 Old National Pike (alt 40 A),  
Middletown, MD





Now, it's your turn. Your turn to start cutting costs and enjoying energy independence. Your turn to join thousands of other homeowners that are making a difference.

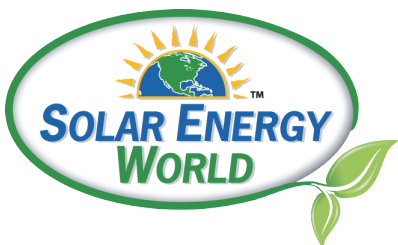
- Reduce your utility bills year after year.
- Save nearly half the cost of your system with federal and state tax incentives.
- Help create a better environment and a better future while increasing the value of your home.

Today, it's your turn to take control.  
Schedule a free in-home solar analysis!

**12 Months**  
**No payments**  
**No interest\***

\* Some restrictions may apply. Consult your tax advisors on government tax credits and rebates. Offers available for installed projects only. MHIC#127353. Promo Code: NPI0610

**SOLAR ELECTRIC SYSTEMS • SOLAR HOT WATER SYSTEMS**



**CALL • CLICK • VISIT**

Schedule a free in-home analysis today! Hurry, offer ends soon!

**301-497-3232**  
**www.solarEworld.com**

# Local Green Building and Energy Programs

## Frederick County, Maryland

Frederick County's Office of Environmental Sustainability manages an Energy Efficiency and Conservation Block Grant from the U.S. Dept. of Energy. The grant supports development of energy and green building programs, including the production of this Solar and Green Homes Tour brochure! To learn more about the office and the programs that we manage, go to our web site [www.SustainableFrederickCounty.org](http://www.SustainableFrederickCounty.org) and take a look around!

### GREEN GOVERNMENT

We recently released a ***Sustainable Action Plan for County Operations*** that provides a coordinated strategy for the integration of sustainable practices into government operations.

#### ***From the Action Plan, did you know that Frederick County Government:***

- ✓ Prepared a Comprehensive Energy Plan for reducing non-renewable energy consumption in FCG office buildings, facilities, and the vehicle fleet?
- ✓ Conducted a GHG Emissions Inventory for County operations and the community-at-large?
- ✓ Implemented a project that utilizes landfill gas to produce 2 MW of electricity?
- ✓ Performs energy audits of its owned and occupied buildings?
- ✓ Invested in USGBC LEED certification for the Brunswick Library, a 15,400 sq. ft. branch to open in spring 2011?
- ✓ Implemented green building practices at the Catoctin Creek Nature Center, scheduled to open in late 2010; the center features a vegetated "green" roof and a geothermal well field and heat pump?
- ✓ Installs water efficiency devices in County buildings like waterless urinals and dual flush toilets?



### GREEN HOMES CHALLENGE

**This fall, our office is launching the Frederick County Green Homes Challenge!** The Green Homes Challenge is a certification program that will assist residents in (1) reducing and tracking residential energy consumption and greenhouse gas emissions, and (2) increase the number of energy efficient devices, retrofit projects, and renewable energy systems installed in the residential sector.

**Interested in becoming a Power Saver?!** The first component of the program is titled, Stop Losing Money, Start Saving Energy. The educational materials help residents navigate a home energy audit, set an Energy Action Plan, and start making affordable energy efficiency retrofits to their home.

For more information on the Green Homes Challenge and other community energy and green building related programs, contact Lisa Orr, Program Coordinator at 301-600-6864 or [lorr@frederickcountymd.gov](mailto:lorr@frederickcountymd.gov).

***The Office of Environmental Sustainability advances practical solutions for protecting the environment, conserving energy, and living sustainably in Frederick County, Maryland.***

# Resources

## Magazines

*Home Power Magazine, The Hands-on Journal of Home Made Power.* This magazine covers various energy topics: solar, wind, PV systems, electric vehicles, batteries, hydrogen, domestic solar hot water, etc. [www.homepower.com](http://www.homepower.com)

*Mother Earth News.* The guide to living wisely features renewable energy projects and helpful sustainable living articles. Published bimonthly. [www.motherearthnews.com](http://www.motherearthnews.com)

*Solar Today, The magazine of the American Solar Energy Association.* Available through The American Solar Energy Society at [www.ases.org](http://www.ases.org)

*The Real Goods Catalogue, (800) 762-7325.* This is a wide-ranging catalogue of conservation and renewable energy, including photovoltaic panels, solar hot water, and do-it-yourself items. [www.realgoods.com](http://www.realgoods.com)

## Books

*Real Goods 11th Edition Solar Living Sourcebook, \$30.* The Sourcebook provides the technical details you need to harness the sun, wind, or water for your home power generation. 600 pages. [www.realgoods.com](http://www.realgoods.com)

*The Solar Electric House: A Design Manual for Home-Scale Photovoltaic Systems,* by Steven J. Strong, Sustainability Press, 1993. A complete guide to solar home design, helping you choose the right system and how to install it.

*Consumer Guide to Solar Energy,* by Scott Sklar and Kenneth G. Sheinkopf. Reduce energy costs while making your home more comfortable with energy efficient products available at your local store. The new edition includes updated information on solar energy tax credits. Available through Amazon.

## Websites

American Council for Energy Efficient Economy - [www.aceee.org](http://www.aceee.org)

American Solar Energy Association - [www.ases.org](http://www.ases.org)

Database State Incentives, Renewable Energy - [www.dsireusa.org](http://www.dsireusa.org)

Frederick County Office of Environmental Sustainability - [www.frederickcountymd.gov/sustainability](http://www.frederickcountymd.gov/sustainability)

Interstate Renewables Council - [www.irecusa.org](http://www.irecusa.org)

MD-DC-VA Solar Energy Industries Association - [www.mdv-seia.org](http://www.mdv-seia.org)

Maryland Clean Energy Center - [www.mdcleanenergy.org](http://www.mdcleanenergy.org)

Maryland Energy Administration - [www.energy.state.md.us](http://www.energy.state.md.us)

Maryland Goes Green - [www.mdgoesgreen.org](http://www.mdgoesgreen.org) Follow us on twitter at: <http://twitter.com/mdgoesgreen>

Potomac Region Solar Energy Association - [www.prsea.org](http://www.prsea.org)

Solar Electric Industries Association - [www.seia.org](http://www.seia.org)

Solar Electric Power Association - [www.solarelectricpower.org](http://www.solarelectricpower.org)

US Department of Energy Energy Efficiency and Renewable Energy - [www.eere.energy.gov](http://www.eere.energy.gov)

U.S. Department of Energy Solar Decathlon - [www.solardecathlon.gov](http://www.solardecathlon.gov)

U.S. DOE/EPA Energy Star - [www.energystar.gov](http://www.energystar.gov)

U.S. Green Building Council - [www.usgbc.org](http://www.usgbc.org)



Every month people who are interested in sustainability meet at informal sessions known as Green Drinks.

All are welcome.

To learn more, go to [www.GreenDrinks.org](http://www.GreenDrinks.org), and search for Frederick, MD or email [rich@mdgoesgreen.org](mailto:rich@mdgoesgreen.org)

# Thinking Solar?

Thank you for participating in the Solar Tour.  
By doing so, you're motivated to make a difference  
and considering a smart financial decision.



Here are **5 Important Questions** about  
your Solar PV installation:

## Questions:

- 1. How do I make the decision to go solar?*
- 2. How much of my monthly electric bill can I offset?*
- 3. How much do federal, state and local incentives offset the total system cost?*
- 4. How can I get the most value for my Solar Renewable Energy Certificates (SREC's)?*
- 5. Does the monthly production of my solar system match what was forecast?*

**410.533.4499**  
kenenergysolar.com



Your source for  
**Energy Independence.**



# Go Solar, with GreenBrilliance

*Our Turnkey Solar Solutions, involve everything from start to finish.*



**Site Assessment  
&  
Solar Analysis**



**FREE Consultation**



**System Design  
&  
Installation**



**Service  
&  
Maintenance**



**Specializing in design and installation of  
Solar Electric & Solar Hot Water Systems.**



**Call Today at 1-888-365-ASKGB**

locally at 703-657-0090 or email for a free consultation at [contact@greenbrilliance.com](mailto:contact@greenbrilliance.com)  
[www.greenbrilliance.com](http://www.greenbrilliance.com)

GreenBrilliance, LLC | 102 Elden Street, Suite 18 | Herndon, VA 20170